International Economics

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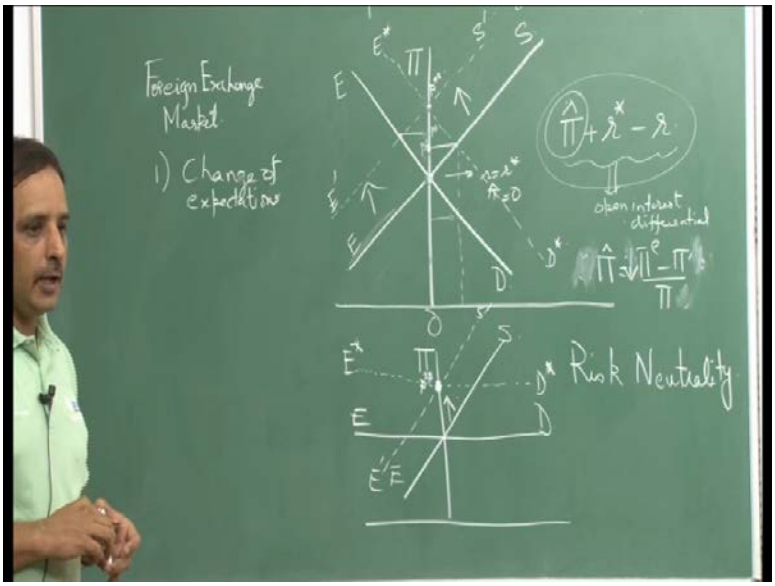

Good after noon. So, we are looking at the role of expectations and interest rates on the exchange rates. We are relooking at the foreign exchange marke,t and the other day we discussed diagrammatically the the role of expectations, and interest rates. How do our expectations and interest rates have an impact on the exchange rate?

So, I am going to for your benefit I am going to redraw the the E D and E S curve, the excess demand and the excess supply curve. And then again try to understand the role of expectations in changing the exchange rates in a country. So, these diagram the y axis you have the exchange rates, it is a unit of a foreign currency 1 unit of foreign currency expressed in units of domestic currency. And then, you have the usual downward sloping E D curve, and you have an upward sloping (No audio from 01:48 to 01:56) you have an upward sloping E S curve.

The E D curve is the excess demand curve for the investors, speculators. Investors, speculators are driven by something called the open interest differential, which is given by pi hat plus r star minus R.

Of course, at this point where you have equilibrium where E D is equal to E S you assume here that r star hat is 0. So, we are looking at the relooking at the foreign exchange market and we have the downward sloping E D curve and upward sloping E S curve. E S is the excess supply curve; E D is the excess demand curve. Excess supply curve is upward sloping because of the assumption that if pi rises it leads to an improvement in the current account balance and there is an excess supply of foreign exchange.

E D curve is downward sloping because this E D curve is the demand by the investors and speculators. So, in case you are at point this where E D and E S intersect and there is a equilibrium and pi hat is pi e minus pi by pi. If pi reduces then this pi hat term goes up. It leads to an open interest differential and an increase in excess demand for the foreign currency.

So, you have the downward sloping E D curve, you have an upward sloping E S curve and this is upward sloping because if pi increases you see an improvement in the current account balance. So, this is made on the assumption that the M L R condition the marshall lerner robinson condition holds. So, this is again relooking at the foreign exchange markets initially you have r is equal to r star pi hat to be equal to zero E D is equal to E S.

Now, there is something which happens which is the change of expectations (No audio from04:56 to 05:36).

The change of expectations is that in this economy (No audio from 05:41 to 05:49) if the market participants start feeling that after an years time your own country's currency will depreciate because of various reasons you probably you fear that they will be global recession in the next year also.

So, there is a possibility that it will lead to an increase in inputs in the next year or there is a possibility that there will be some situation where the two countries, two gulf countries have a war and that has an impact on the Indian economy. So, you fear that

there will be an increase in imports after in a year's time. So, what you fully anticipate underline fully anticipate is a shift of the excess supply curve to the left. You anticipate that may be tomorrow next year there will be an increase in imports and your currency may depreciate after in a year's time.

Now, see how that thing has an impact on the actual exchange rates. People are just thinking that your currency may depreciate after a year's time. That has an impact on today's exchange rates. So, expectations have a role to play in determining your exchange rates. Till date we have studied the open interest differential where we said that depreciation is a function of the interest differential.

Now, I brought in another parameter which is expectations. If you expect that your currency will depreciate it does have an impact on the actual exchange rates today. So, what happens is that you are expecting that your currency would depreciate. This would mean that if you are looking at the open interest differential specially this term pi hat which is the expected rate of change of exchange rate you expect this to go up.

So, you expect pi hat to go up; that means, foreign currency you expect foreign currency to appreciate or your currency to depreciate. It leads to an increase in open interest differential. When it leads to open increase in open rate differential there is a incentive to invest in foreign bonds. When you have to invest in foreign bonds you would demand foreign currency when you will demand foreign currency the E D curve will shift to the right. Because E D curve the shift the E D curve shifts because of two reasons one is the foreign interest rates the other is the expectations.

So, the E D curve shifts to the right, but because every investor, speculator is not risk neutral. He is risk averse he will not completely switch in to foreign bonds. So, that is the reason that the E D curve it shifts to the right the currency depreciates to P dash only and not to P double star. So, there is this excess demand, the exchange rate moves to P dash and this excess supply of foreign exchange is met by the other market participants because with an increase in pi. There is an increase in excess supply because the marshall lerner condition holds.

So, the new equilibrium point is P dash and it is not P double double dash, but it does bring stability in the system. If the actual exchange rate after an year's time moves to P double star because in that case if you are at P double star then it brings stability because

the investors speculators would think that they can buy the foreign currency at P dash. And then probably and after an year's time sell it at P double star.

So, if the actual works out actual exchange rate works out be P double star speculation brings stability in the foreign exchange market. All this time we had used speculation as a word pejoratively. I mean we would think over speculation would always bring disorderly conditions in the market, but this is a case where speculation brings stability in the in the system, but there is another possibility.

After an year's time your currency may not depreciate in fact, it may remain here only here at this point that equilibrium point. Then investors speculators have to revise their expectations, but in that process they would lose because they had thought that they would buy exchange rate at a price P dash and sell it at P P double star, but it worked out to be lower than P dash in this case they would lose. And then in this foreign exchange market you have to make quick decisions. You may be rationale or you may be irrational. It is not a question of that it is a question of how quick you are in making your decisions.

So, you may you. So, so there will be some speculators who will make profits, but there will be some who would lose. Just because it the decisions have to be quick in the foreign exchange markets. So, this is a case where the expectations you would have expected currency to depreciate and your currency indeed depreciated. And in that process these speculators investor investors made profits.

What would possibly get back the equilibrium point of P star because if after one year the B O P, balance of payment actually improved and the curve shifted upwards then we would get P double star, but what could get the equilibrium factor P star once it reached P P.

So, if it is you yours P dash and it is P star. So, if the actual exchange rate moves here. So, this thing that pi hat that open interest differential would become 0 and here you would not have any open interest differential. So, this will be like equilibrium. So, this thing goes up and you reach a point like this where the open interest differential becomes 0. I am talking of a situation where this does not move.

So, then it stays here. So, what will prompt the market participants to revise their expectations? Something will happen in the economy and remember when pi gets increased there will be some sort of current account surplus. And when you have a current account surplus you know what happens to the exchange rates.

It has to appreciate.

What has to appreciate ours or theirs?

Ours.

Ours would appreciate, theirs would depreciate. So, this thing instead of going up will go down and then you have to revise your expectations here. So, but in that situation investors speculators would lose because they thought that it would rise, but it would it would go down. Now, this is when you fully anticipate that there is a shift of the E S curve or there are smart people in the markets who already know that after an years time our currency may depreciate.

But, look at a common man. He is not thinking what will happen to our exchange rate after an years time? So, think of a situation second situation when you do not fully anticipate the changes in the E S curve. So, in that case what happens is that the E S curve in fact, shifts and then you come to know that your currency has depreciated. So, you are not fully anticipating the changes. You find that tomorrow 1 U S dollar becomes 60 for example. Now, that is a situation where your exchange rate depreciates from here to P double dash.

But, now look at a situation which is different from this from the earlier one. Now, because it has reached here and you have a current account deficit. Now, the expectation is that the exchange rate will now come down from P double dash to this equilibrium point. So, then now the when the exchange rate has moved up, it has depreciated. Now, the expectations is not that pi e will go up, it the expectations is that it will go down. And therefore, you would have foreigners who would like to invest in your bonds.

In that situation again the if the investors, speculators think that now they could sell at this at this rate and then buy at later at a lower price. This is what they would think now, but if the actual exchange rate works out to be P double dash. Then it will bring

instability in the foreign exchange market. If the actual exchange rate turns out to be this point then it bring stability in the in the foreign exchange markets.

So, that is how you would look into a situation where you do not fully anticipate the change in the exchange rates. Let me repeat again this point. This is a situation which is different from the first. The first was a situation where you would expect that after an year's time your currency would depreciate or foreign currency would appreciate. The second situation is that your currency depreciates and you come to know today that it has become one US dollar has become 60 rupees.

Now, look your currency is depreciated there is a current account deficit. Now there is something which happens to the expectations. Your expectations are not that they are going to rise, but your expectations are that it will come down to this situation. So, that would mean that the there will be an incentive for foreigners now to invest it invest money in your domestic bonds.

But, there is always a possibility that the actual exchange rate may shoot up to P double star or it may remain here. It may be a point which is below P double dash. If it is a point below P double dash then investor, speculators would make profit because then they would sell it at P double dash and then buy it at a lower price, but if it works to be P double star then you would sell at a lower price and buy at a higher price. It brings instability in the foreign exchange markets and these decisions have to be quick.

So, any investor speculator can make losses because of this. So, what I am trying to communicate is that these expectations do pull up these exchange rates. And we saw that here because you had investors, speculators on the one hand and you had the other market participants. These changes in interest rates and expectations do have an impact on the changes in the exchange rates.

Now, think of another interesting situation where you have an E D curve which is not downward sloping, but it is perfectly horizontal. Now, this is a situation when all investors, speculators are risk neutral. Risk neutral means that they consider domestic and foreign bonds as perfectly substitutable. So, as soon as they find that there is an open interest differential they will completely switch out from domestic bonds into the foreign bonds. And you have the upward sloping E S curve which is the excess supply curve it is upward sloping because the marshall lerner condition holds.

If there is an increase in pi it would lead to an improvement in the current accounts surplus because the M L R condition holds. So, this is a case of risk neutrality where the E D curve is perfectly horizontal. Now, think of the same situation the first situation there is a change of expectation, but you fully anticipate the changes in the supply curve; that means, you think that after a years time your currency would depreciate. You are just thinking, that means, the market participants are thinking that tomorrow there will be or may be an after an years time there will be a surge in imports because of various reasons. It would have some impact on the exchange rate, your exchange rate may depreciate.

So, your this is what you are expecting the your currency to depreciate foreign currency to appreciate and reach a level of P P double star. Now, what it will do is that it will immediately prompt the E D curve to shift. It would shift immediately to that point. So, that you are the exchange rate moves from this equilibrium point to P triple star.

So, here there was a lagged response of the exchange rates. The first the exchange rate depreciated by some amount and then later on it went up to its final equilibrium value. This was because this E D curve you had to assumed that people are risk averse. They do not completely switch out from domestic bonds to foreign bonds, but here the difference is that as soon as there is a differential that differential cannot hold for long. As soon as they you find that something is favoring. You completely switch from domestic bonds to foreign bonds. So, that differential never remains your exchange rate immediately moves to P P double star.

So, it is like self fulfilling prophecies of each individual. You felt that there will be some depreciation and then in actual practice you saw that the exchange rates did depreciate immediately. So, this is a case of risk neutrality where your exchange rates immediately depreciates after the expectations were that it will depreciate after an years time, but it did not have an impact. It did pull up the price of the foreign currency and your currency depreciated immediately.

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No. Making profits one time say if you have a higher interest rates you would immediately put your money and that is finished nothing like sustaining. Remember the when we are discussing the mundell fleming model that k k curve was made with the

assumption that there is an imperfect substitutability between domestic and foreign bonds. If there is perfect substitutability I said that k k curve is horizontal. Reason that in case there is differential there will be a onetime switch and therefore, they you will, the differential will not hold and it will be a onetime shift only.

So, there is a profit motive, but there is a onetime shift finished after this. So, that is what happens here the E E dash S dash curve shifts up and so, does the E star D star curve. Here there was a difference. So, there is something interesting about the exchange rates. In the 70s there was a work which was done by NIT Professor Don Bush. Professor Don Bush has also written many macro economics books. If you I do not know whether at present you are looking at Don Bush. So, he was looking at the foreign exchange markets and he gave a model of exchange rate overshooting.

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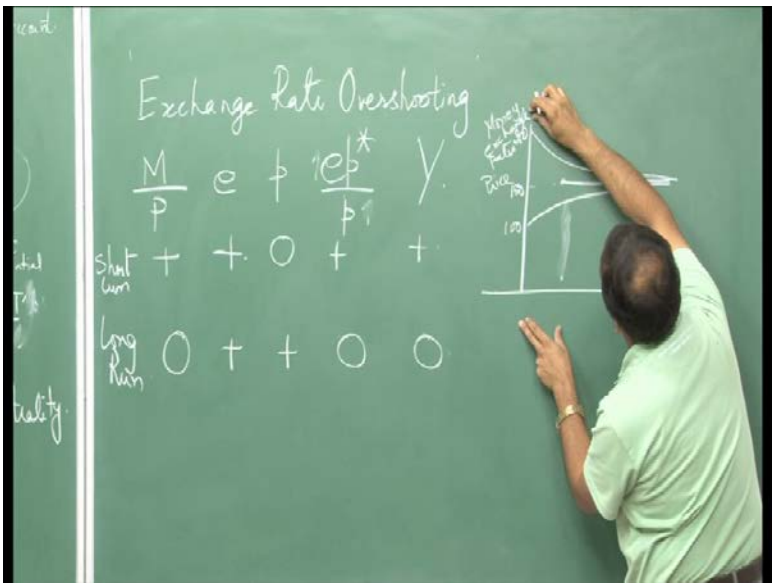

So, he gave a model of (No audio from 25:39 to 25:51) and he was concerned about the exchange rates which overshoot their targets and there are other variables in the economy which are pretty much sticky. They do not change immediately with the changes in other variables, but you have this exchange rate which moves swiftly and then overshoots its target and then overtime it comes back to the equilibrium.

But, there are others which do not change the prices do not change immediately it is overtime that prices change and then eventually you see an equilibrium in the long run. I am not going into the detail of this model, but the story is something from what we had

already discussed? Remember the I S l m framework that we discussed. We discussed the effectiveness of monetary policy in the case of fixed and flexible exchange rate.

We discussed the case of fiscal policy in the wake of fixed and flexible exchange rates. And then we brought in capital mobility, no capital mobility, little capital mobility, high capital mobility and perfect capital mobility. The results were the following monetary policy was ineffective in raising incomes and employment in the case of fixed exchange rate whether with no capital mobility with limited capital mobility, high capital mobility, a perfect capital mobility. Monetary policy was ineffective in raising incomes and employment. Reason remember when your increase money supply the interest rates go down, the incomes go up the imports go up.

So, you have a deficit, when you have a deficit and it is a fixed exchange rate someone has to intervene in the markets to bring to have parity in your exchange rates. So, that someone is the central bank. Central bank intervenes they lose the foreign exchange, but loss of reserves is related to the decline in money supply.

So, when you had increased money supply initially to raise incomes and employment, but then the changes in reserves brought had an impact on the money supply. The money supply went down and so, the l m curve which had shifted to the right would shift to the left and you will be back to the equilibrium. This is when you do not even have capital mobility. If you have if you bring in capital mobility; that means, if the interest rates goes down according to the mundell fleming framework there will be a capital outflow. You will have a heavy balance of payment deficit someone has to intervene in the foreign exchange markets.

As soon as you start losing reserves it will decline decrease the money supply swiftly. So, your l m curve which has shifted to the right will swiftly move back to its original position. You do not have monitory independence in case you have a fixed exchange rates. So, all countries who adopt a fixed exchange rates are concerned about the monetary independence. This was the monetary policy. What was the impact of monetary policy on income and employment when you have a flexible exchange rates?

It was altogether different it was totally opposite because if you decrease money supply, incomes go up imports go up. You have a balance of payment deficit this is not a fixed exchange rate. So, your exchange rate needs to depreciate when your exchange rate

depreciates your I S curve shifts to the right where your I S curve shifts to the right. What if you bring in more capital mobility? What happens if you bring in capital mobility?

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No because when you bring in capital mobility interest rates have gone down. There is a capital outflow. Heavy balance of payment deficit more depreciation of the currency larger shift of the I S curve to the right. So, your l m curve shifts to the right I S curve shifts to the right. Monetary policy is totally effective in increasing income and employment in the case of perfect capital mobility. Now, I want to go a step beyond this. Now, here remember right from the beginning we had made these stringent assumptions that prices are fixed. Then we had said sterilization then we slowly relaxed that and we said there is no sterilization.

Now, please assume what happens if you assume that the prices change? If the prices change something happens in the economy. This whole thing that the is l m framework then the effectiveness of monetary and fiscal policy was build on the assumption that the prices were fixed. Now, assume that the prices change, what do you think will happen in this case when you have a flexible exchange rate and the prices go up? My hint is please look at this variable M by P. Please look at the variable M by P e p. (No audio from 31:41 to 31:55)

I want you to look at these parameters in the short, and the long run assuming that the prices now are changing, and you have a flexible exchange rate. So, the story there the day before yesterday ended, when we said that the monetary policy is effective in raising incomes and employment in case of flexible exchange rate. Now, remember when you increase incomes, and you assume that the prices are also a variable the prices go up.

So, the real money supply remember what had happened you had increased money supply now the prices are going up. So, your real money supply reduces. So, when your real money supply reduces see what happens?

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The exchange rate which had depreciated would now appreciate because your real money supply is going up your interest rates are going up. So, there is an inflow of capital coming in which is having an impact on the exchange rates. So, then what happens is that what Don Bush was saying that when you increase money supply in the short run the exchange rate overshoots it target.

But, when as soon as the prices start increasing and the real money supply reduces your currency starts appreciating. So, so when you had increase the money supply the exchange rate overshoots it is target and when and then when the prices starts increasing. The exchange rate also returns to its equilibrium position.

So, the story of the exchange rate overshooting comes from what happens to these parameters in the short and the long run? So, then you if there is an increase in the money supply M by P increases. There is no nonimpact of prices in the short run. This is the story that we had read couple of days back, two days back that there is effectiveness of monitory policy in the case of flexible exchange rate. We you see immediate depreciation of the currency because of the same argument incomes go up, imports go up you see depreciation of the currency. (No audio from 34:30 to 34:45)

So, in the long run you would see changes in the exchange rate, but this exchange rate which had depreciated and it had over shot it is target because of the changes in prices. It will be back to equilibrium. Reason being that when the prices go up l m curve shifts to the left the real money supply reduces. So, you see an increase in interest rate there capital coming in which leads to appreciation of the currency.

As a result you see changes in p, but no changes in e p star by p because now p also moves e also moves. The real exchange rate remains as it is as there is no change in e p star by p and there is no change in incomes. (No audio from 35:39 to 36:20).

So, I can just think about it. You can see a diagram where you put say money supply, exchange rates and price on the y axis. So, you have three things money, exchange rates and price on the y axis and you have time on the x axis. So, what happens in the short run is that if you increase money supply the variable which gets affected immediately is the exchange rate it.

So, the exchange rate it overshoots it is target reaches a point like this. The money increased money supply increased to 150 exchange rate overshot it is target and reached here. The prices in the short run they are sticky they do not change. So, the short run thing is prices as it is money supply has gone up exchange rate. The change in exchange rate is greater than the change in the money supply. And, but then in the long run with time - overtime the prices go up. The exchange rate also comes back to it is equilibrium position.

So, in the long run you have all these three which are together. So, that is it is just a simplistic version of what Don Bush was trying to say that there are other variables which have a lagged response, but exchange rate it first overshoots it is target, and only when the other variables change over time that the exchange rate will come back to its equilibrium position. So, that is all that I have today. Tomorrow, we are going to discuss the derivative markets in international trade.